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EXAMINER				
SHABMAN, MARK A				
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/581,075

**Applicant(s)**

KATSUDA ET AL.

**Examiner**

MARK SHABMAN

**Art Unit**

2856

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 25 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 4-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 4-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments with respect to claim 1 have been considered but are moot in view of the new ground(s) of rejection.

### ***Claim Objections***

Claim 8 is objected to because of the following informalities: As amended claim 1 now discloses the "ceramic wiring substrate" and "ceramic dielectric layer", the previous amendments made in lines 4 and 7 for lack of antecedent basis can be changed back to their original form. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1 and 4-9** are rejected under 35 U.S.C. 103(a) as being unpatentable over Isaki (Japanese machine translation provided in previous correspondence) in view

of Gehman US PGPub 2005/0081603 A1 (hereinafter referred to as Gehman) in view of Naito US PGPub 2003/0188968 (hereinafter referred to as Naito).

**Claim 1** is rejected under 35 U.S.C. 102(b) as being anticipated by the English machine translation of Isaki JP9021774 (hereinafter referred to as Isaki).

Regarding **claim 1**, Isaki discloses a humidity and gas detecting element as seen in figure 1 of the drawings. The background of the invention on page 9 discloses a conventional gas detection element wherein the gas detection portion "includes a diaphragm structure section" formed of a silicon substrate as claimed. It would have been obvious to use such a detector for the advanced accuracy it provides. The sensor comprises a "gas detection element" 6 (paragraph 0029). A ceramic substrate 8, as seen in figure 3, in conjunction with the holding member 3 (also made of ceramic in paragraph 0013), in figure 1 form a "ceramic wiring substrate" to which the detection element is mounted (paragraph 0031). As the total wiring substrate includes a cavity, more easily seen in figure 1b, the gas detection element is mounted in the substrate, below the cap 5, as claimed. A "protective cap" is present as the breathability covering device 5 can be seen in figure 1 which is made of metal as disclosed in claim 5. When the protective cover is attached, a "gas measuring space" is present (seen in figure 1b) and ventilation holes in the covering device allow gas to be introduced to be measured in the gas-measuring space as claimed.

Naito discloses a gas sensing element which operates in a similar manner as Isaki's. The substrate of Naito is multilayered ceramic sheets as is known in, and common in the art. It would have been obvious to one of ordinary skill in the art at the

time of invention to manufacture the substrate of Isaki in a similar manner since a ceramic substrate would exhibit strong insulating properties thus reducing the chance of error in a gas reading.

Gehman discloses a gas vapor sensor in which a housing and cover are provided where the cover snaps onto the housing to attach it. The housing comprises a recess formed on two sides and the cap comprises a perpendicularly projecting portion which engages into the recess of the housing to secure the cover in place. The cover further comprises an inlet in the surface which allows the gas to enter the sensor for measurement. It would have been obvious to one of ordinary skill in the art at the time of invention to secure the cover or cap of the present invention in a manner similar to that of Gehman to allow for easy removal for access to the sensor and corresponding electronics. Further, as Gehman teaches the use for a removable (non-adhering) lid as shown in figure 1, the variations present in the claimed invention are considered to be a design choice of the applicant and therefore are not found patentably distinct from the prior art.

Regarding **claim 4**, the sensors of Isaki, Naito and Gehman all comprise substrates or corresponding substrate structures of "substantially quadrangular shape" when viewed along the direction of the lamination. Gehman illustrates the recess formed on each of at least two opposed side surfaces. When combined with Isaki and Naoki as previously described, the recesses are located on the ceramic wiring substrate as claimed.

Regarding **claim 5**, the recess of Gehman is formed on the side surfaces of the housing to guide the "projecting portions" of the cover to locations where they are fitted securely. In combination with the ceramic substrate as previously discussed, the guides would be formed in said substrate as claimed.

Regarding **claim 6**, the background of the invention discloses a gas sensor including a "diaphragm structure section" and a "gas detection portion" as claimed. Isaki shows in figure 1 a "plurality of gas intakes" formed in the cover opposite the surface of the ceramic wiring substrate. It would have been obvious to one of ordinary skill in the art at the time of invention to arrange the intakes of Isaki in a manner which would allow air and gas to enter the sensor but not cause damage to the detector or diaphragm due to a potential burst of air through the openings. To ensure this does not occur, one would arrange the intakes so they are not directly overhead of the detection elements which could be in a number of configurations, thus making the gas detection element "invisible" when viewing through the cover.

Regarding **claim 7**, Isaki illustrates in figure 3 electrodes 9-13 located on the substrate as part of the gas detection element (paragraph 0031). The electrodes are connected to the lead frame 2 via wire bond 7 (paragraph 0035). Since the gas-detection element is connected to the substrate it would have been obvious to one of ordinary skill in the art at the time of invention to connect them via "connection portions" or any other means suitable which is known in the art. The separation of two pieces and subsequently reconnecting them in such a manner is common practice. It would have been obvious to one of ordinary skill in the art at the time of invention to conceal

the "connection portions" from view through the top cover by segregating or covering them separately to avoid any potential corrosion from forming on them and causing destruction the sensors

Regarding **claim 8**, replacing the gas sensor with the one disclosed in the background of the invention as comprising a diaphragm, the diaphragm structure section would contain the gas detection portion as claimed. Naito discloses layering ceramic sheets as substrate thus any wiring of the substrate would be sandwiched in between. Since substrates are used for "wiring" of electronics, it would have been obvious to one of ordinary skill in the art at the time of invention to connect electronically any pieces of the substrate which need to be in communication with one another in a similar manner. Since a diaphragm works under the principle of a changing pressure and is located between two chambers in order function, it would have been obvious to one of ordinary skill in the art at the time of invention to form a recess in the lower or opposite layer of the substrate to allow for the diaphragm to function properly.

Regarding **claim 9**, the "gas detection element of Isaki is located on the top side of the ceramic substrate and thus there exists a bottom surface on the opposite side which is "substantially planar". Outer electrodes 2 are present which allow the sensor to be connected to a circuit board. While it is not explicitly shown, it would have been obvious to one of ordinary skill in the art at the time of invention to construct the electrodes as forming from the bottom of the substrate as they are to be attached to the circuit board below the sensor.

**Claim 10** is rejected under 35 U.S.C. 103(a) as being unpatentable over Isaki in view of Gehman in view of Naito US PGPub 2003/0188968 as applied to claim 1 above, and further in view of Gole US Patent 6,893,892 B2.

Regarding **claim 10**, Isaki discloses the invention in its entirety with the exception of a plurality of gas detection elements which respond to different gas species. It was known in the art at the time of invention to include multiple sensors within a gas detector to detect multiple gases without the need for additional sensing units. Gole teaches using series of gas sensors mounted on a substrate to detect multiple gases (i.e. gases associated with engine exhaust) in a single sensor (column 17 line 64). Further, it would have been obvious to one of ordinary skill in the art at the time of invention to add a second, similar sensor for detecting a second gas in the same manner as the first, since it has been held that mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USP 8.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not



mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARK SHABMAN whose telephone number is (571)270-3263. The examiner can normally be reached on M-F 8:00am - 4:30pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on (571) 272-2208. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. S./

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Art Unit: 2856

Examiner, Art Unit 2856

/Hezron Williams/

Supervisory Patent Examiner, Art Unit 2856